

Simrad EQ32 MKII Echosounder

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1.1 Introduction and system familiarization

Congratulations on your purchase of **SIMRAD EQ32 MKII Echo-sounder and Fishfinder** - a totally new generation from Simrad Shipmate AS. Great care has been taken to create this innovative video sounder... both in design and performance. It includes features that usually only can be found in professional fish detection equipment: selectable frequencies, A-scope, white line, bottom lock, etc.

The EQ32 MKII is a unique new slim-line product in the Simrad Marine Line, and is available with a 6" large LCD display in TFT color or monochrome.

How to use this manual?

It is a good idea if you make yourself familiar with the key functions and menu structure described in section '2.1 Keypad' and '2.3 Menu bar' before you start out, and then proceed with section '2.2 Getting started'. Throughout the manual, the  callout emphasizes important points. If your EQ32 MKII is the monochrome version, it will not be possible to apply the color features described in the manual.

1. 2 Safety summary

Quality service personnel

The EQ32 MKII is sealed and does not contain any user serviceable parts. Opening of the unit will void its warranty. Touching electrical parts inside may cause bodily harm or death. If the unit is not working properly, check Chapter 6 - Maintenance, Troubleshooting, Repair. If your EQ32 MKII requires servicing or repair, call your authorized SIMRAD dealer.

Power source, fuse and power cable

Check that the DC power supplied to the unit is within the range of 10 to 32 volts. Note that the appropriate fuse must be employed (see the fuse rating in section '5.3 Connections'). Ensure that the power cord is firmly attached.

Grounding

The EQ32 MKII is a sophisticated piece of electronic equipment. To reduce electrical interference and risk of electrical shock, properly ground the unit to the ship's ground using the ground screw on the back of the unit.

Glossary of terms

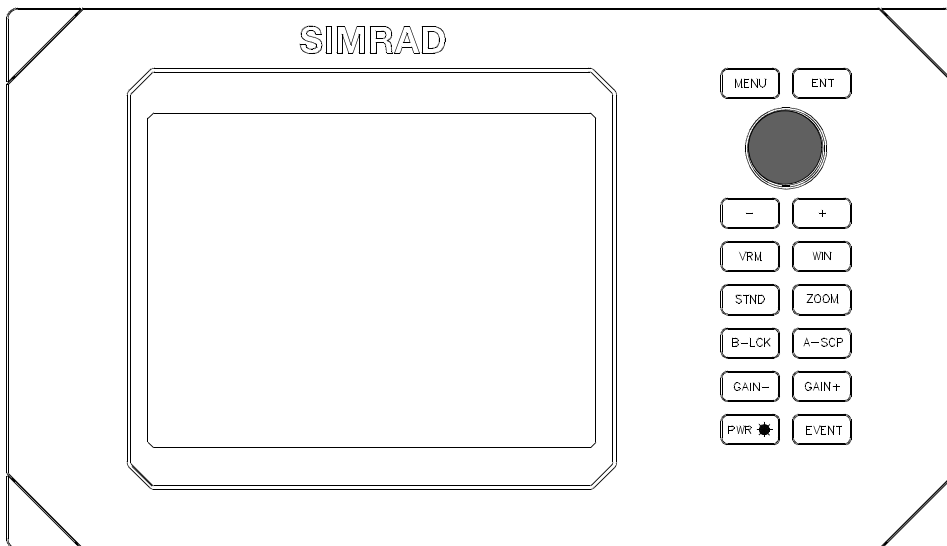
If you have never used an echosounder before or if you are unsure of how a term is used in this manual, then turn to Appendix A - Glossary of terms.

Default settings

All user implemented data in the EQ32 MKII can be erased by making a reset of the unit and thus return to factory default settings.

Principles of operation

The scientific principles of the operation of the EQ32 MKII are explained in *Chapter 3 - Principles of operation of an echosounder*.



2.1 Keypad

The EQ32 MKII is an easy-to-use echosounder. The functions are quickly accessible through on-screen menus or directly from the keypad.

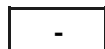
The [ENT] key has the special function of opening and closing for insertion/editing of data. Use the multi-direction cursor key to move around in the menus, and to place the cursor on the function you wish to change, then select the data by using the +/- keys.

Key functions

- | | |
|-------------|---|
| MENU | Turns the menu bar on/off. Exits any data display without taking any action. |
| ENT | ENTER - turns cursor on/off. Opens for/confirm insertion and editing of data. |



Use the multi-direction cursor key to move around in the menus and displays + move VRM up/down.



+ and - toggles between available values/scales/ranges.



Variable Range Marker.



Toggles between four pre-selected windows. Hold two seconds for automatic rotation of preselected displays. Press [WIN] again to return to normal operation.



Full-screen STANDARD echosounder display with indication of depth and water temperature, etc.



Combination screen: standard display and expanded area around the variable range marker.



BOTTOM LOCK - combination screen: standard display and expanded area around the bottom.



A-SCOPE - combination screen: standard display and graphic picture of echoes from last ping.



GAIN+ (plus) and GAIN- (minus) will adjust received echo - gain/reject echoes.



Press and hold the [PWR] key to turn the POWER on. Enters feature to adjust light/contrast in screen, and background light in keypad. Press PWR twice (1 short and 1 long press) to turn the unif off.



Placing a vertical line in the depth display for indication of e.g. fish.



2.2 Getting started

PWR * *To turn on the power, press and hold the [PWR] key till a picture appears on the screen*

PWR * **MENU** *Press [PWR] again to adjust light/contrast, and press [MENU] to exit the function*

To customize the EQ32 MKII to suit individual likings can be done as you go along i.e. choose a different color for the display background, text, menu, etc. But to start out it will be wise to select the **display language** you prefer to be using:

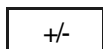
MENU *Call up the MENU bar*



ENT *Use the cursor to highlight the first line in the SETUP menu, and press [ENT]*



Go to the bottom line



ENT *Select language, and confirm*

Rotation of WINdows

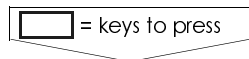
WIN *Press [WIN] repeatedly to leaf through the 4 windows currently selected for rotation*

The sequence of the 4 displays will be as they are selected. If you only need 3 or 2 displays in the rotation, then you call up the same display in more than one WINdow to make the total of 4:

Press [WIN] to select the first display, press [WIN] to select the second display, press [WIN] to select the third display, press [WIN] to select the fourth and last display.

2 sec's **WIN** *Start automatic rotation of preselected windows at a preselected time interval (adjustable, see page 24+25)*

WIN *Press the [WIN] key again to return to normal operation*

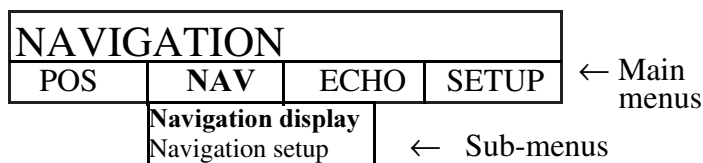


2.3 Menu bar

MENU *Toggles the menu bar on/off*

The menu bar is placed at the top of the screen, and the individual menus are selected by using the cursor key to highlight the menu, and pressing [ENT].

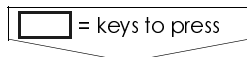
To fit in the complete menu bar across the screen, some of the menus have been abbreviated. However, the last selected menu will be highlighted, and if it's an abbreviation of the menu, then the complete menu title is written above the menu bar e.g.:



Having selected e.g. NAVIGATION from the menu bar, its associated menus (sub-menus) will drop down. Use the cursor key to highlight the function you wish to call forward and press [ENT].

If you want to switch to a different menu, use the cursor key to move to the adjacent menu.

The menu bar will disappear from the screen at the selection of a function, or by pressing the [MENU] key. Besides - if not used, it automatically turns off after 30 seconds.



2.4 Menu selection

The EQ32 MKII is operated by making selections from various on-screen menus or by gaining direct access from one of the keypad's function keys.

POSITION MENU - Position display *Call up the MENU bar*



POSITION			
POS	NAV	ECHO	SETUP
Position display Decca lanes Loran C			



Use the cursor to highlight 'Position display', and press [ENT] to call up the position display

 The echosounder must be connected to a navigator to receive a valid position.

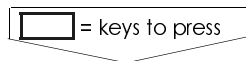
Status No valid POS	Log 1 0.0nm	Log 2 0.0nm
LAT	56°53.000	N
LON	9°50.000	E
Water speed *. *kn	Course * °	Depth S 74.7 m
Water temp. *. * °C	Local Time 18:09:38	Local date 6- 5-2000

Trip log 1 and 2
(see next page)

Position with three decimals in minutes.

Speed over ground/Water speed. Course, magnetic or true. Depth.

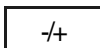
Water temperature.
Local time and date.
(see next page)

**To reset log, or set time**

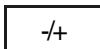
(use cursor key to move around in display)



Open for change



Reset log / insert alternative start figure



Adjust local time and date



Confirm entry

 = keys to press

POSITION MENU - Decca lanes

 **MENU**

Call up the MENU bar



 **ENT**

Use the cursor to highlight 'Decca lanes', and press [ENT] to call up the display

55°54.219N

12.4kn

15°06.424E

121°

Position in latitude/longitude from external navigator.

Decca chain:

01 0E

Name: Vestlandet

RED

D 9.82

GREEN

C42.52

PURPLE

E52.50

Position converted into decca coordinates.

See list of decca chains in Appendix B.

 **ENT**

Open for entry

 **-/+**

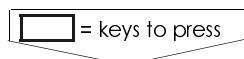
Select chain number

 **-**

*Clear chain number by pressing the [-] key repeatedly until ** appears*

 **ENT**

Confirm entry

**POSITION MENU - Loran C***Call up the MENU bar**Use the cursor to highlight 'Loran C', and press [ENT] to call up the display*

55°54.219N	12.4kn
15°06.424E	121°
Loran C chain:	9940
Name: West Coast US	
	W 11210.59
	X 28943.89
Offset W: +00.00	
Offset X: +00.00	

Position in latitude/longitude from external navigator.

Position converted into Loran TDs.

See list of Loran C chains in Appendix B.

*Open for entry**Select chain number, or clear chain number by pressing the [-] key repeatedly until ** appears**If required, go to the slaves and toggle between available slaves (not all chains have several slaves to choose from)**and it is possible to alter the figures in the time delay**If required, go to Offset, and key in a positive or negative (toggle with +/-) offset to the time delay**Confirm entry*

 = keys to press

NAVIGATION MENU - Navigation display

 MENU

Call up the MENU bar

NAVIGATION			
POS	NAV	ECHO	SETUP
Navigation display		Navigation setup	



 ENT

Use the cursor to highlight 'Navigation display', and press [ENT] to call up the display

To receive any useful information in the EQ32 MKII navigation display will require that a navigator is connected via the NMEA input port.

☞ The connected navigator must be in a navigation mode, which could be Cursor, Waypoint, Route or Track navigation. See next page.

NAVIGATION MENU - Navigation setup

The navigation setup display can either be accessed by using the cursor to highlight 'Navigation setup' in the menu and pressing [ENT], or by pressing [ENT] from the navigation display:

Navigation setup:

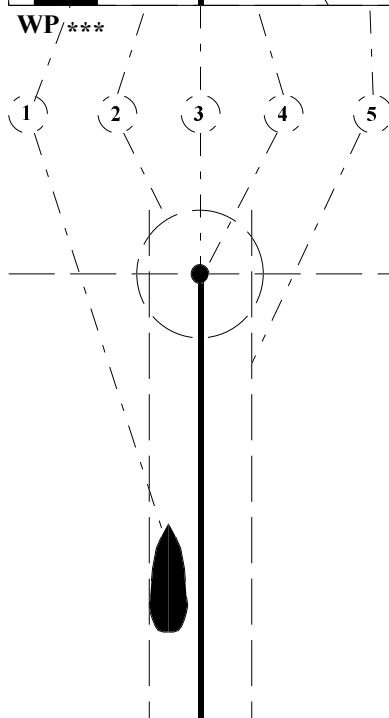
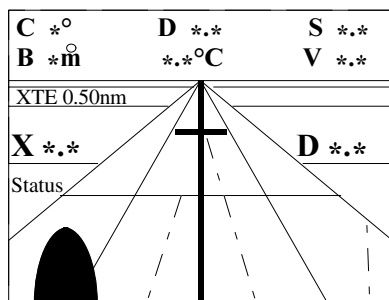
Course and bearing as: MAGNETIC
XTE alarm distance: 0.50

Readings of course and bearing can be set to either magnetic or true.
Alarm can only be initiated from the connected navigator.

 ENT

Return to the navigation display (motorway)

Navigation display (motorway):



C: Course over ground

D: Depth

S: Speed over ground

B: Bearing to approaching waypoint

°C: Water temperature

V: Speed towards waypoint - "velocity"

X: Cross-track-error

D: Distance to waypoint

Bottom line in display indicates WP number or route number.

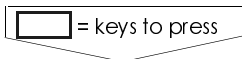
1. Ship's position in relation to intended track. (Does not indicate heading).

2. Waypoint circle alarm - the connected navigator will send out an alarm when the ship is touching the circle.

3. Ideal course line between two waypoints starting from ship's position when NAV is activated on connected navigator.

4. Waypoint and waypoint line - the connected navigator will send out an alarm when the ship is reaching the point/line.

5. XTE alarm lines - the connected navigator will send out an alarm if the ship touches the lines.

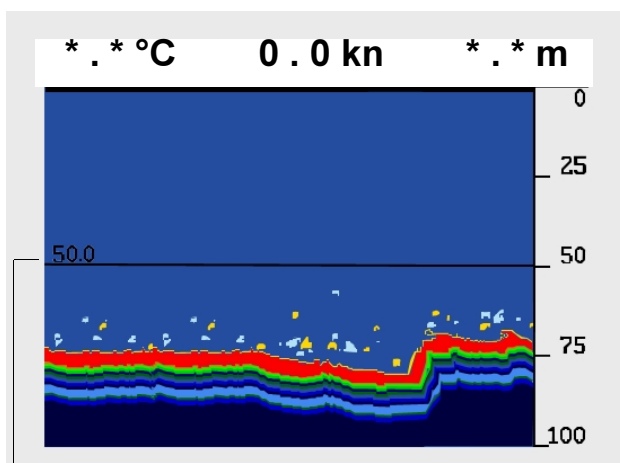
**ECHOSOUNDER MENU - Echosounder display***Call up the MENU bar*

ECHOSOUNDER			
POS	NAV	ECHO	SETUP
Only available with Echo display on screen.		Echo display	
		Bottom expansion	
		VRM expansion	
		Turn A-scope ON/OFF	
		Turn VRM ON/OFF	
		Presentation setup	
		Echosounder setup	

*Use the cursor to highlight 'Echo display', and press [ENT] to call up the display, or...**... access the display by pressing the [STND] key*

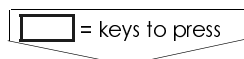
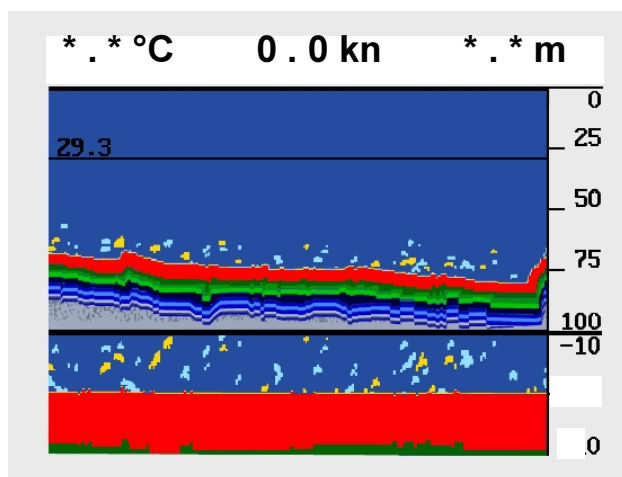
This is the basic presentation mode (standard display) for observing fish schools and seabed.

Top line indicates: Temperature, speed and depth.



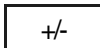
The depth range can be adjusted by +/- or set to automatic - press [ENT] to open 'Presentation setup' if any changes are required. Press [ENT] again to confirm changes and to return to the standard echosounder display.

VRM A transmitter status window will appear in the bottom left corner (not shown in this display example), - refer to page 21.

**ECHOSOUNDER MENU - Bottom expansion***Call up the MENU bar**Use the cursor to highlight 'Bottom expansion', and press [ENT] to load the function, or...**... activate the function by pressing the [B-LCK] key*

The bottom lock expansion feature ensures a reliable depth readout and provides a compressed standard display in the upper 2/3 of the screen.

The depth range at the right of the screen can be adjusted by means of the [+/-] keys.

*Open 'Presentation setup' (see display on page 22) if any changes are required in the setup e.g. the 'Expansion window' - number of metres above the bottom,**and confirm entry**Change range with the + or - key**Return to standard display*

= keys to press

ECHOSOUNDER MENU - VRM expansion

MENU

Call up the MENU bar

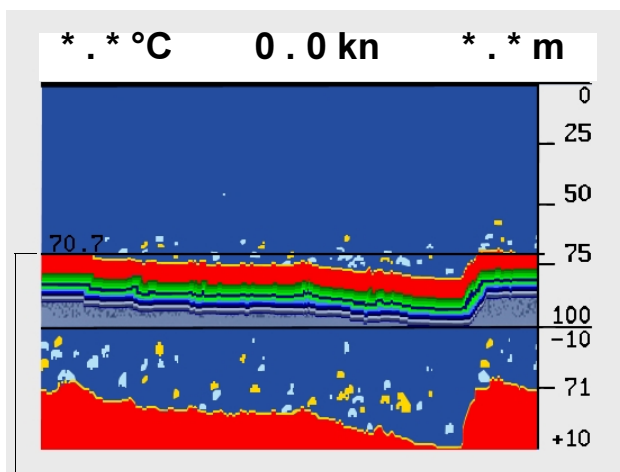


ENT

Use the cursor to highlight 'VRM expansion', and press [ENT] to load the function, or...

ZOOM

... activate the function by pressing the [ZOOM] key



This feature will provide an expanded view of the area near the Variable Range Marker which will give a better separation of echoes. The zoom level can be selected in seven steps ranging from 3 to 50 meters, feet or fathoms. (Setup for units, page 24).

The VRM can be moved up/down by means of the cursor.

ENT

Open 'Presentation setup' (see display on page 22) if any changes are required,

ENT

and confirm entry

+/-

Change range with the + or - key

STND

Return to standard display

 = keys to press

ECHOSOUNDER MENU - A-scope

MENU

Call up the MENU bar

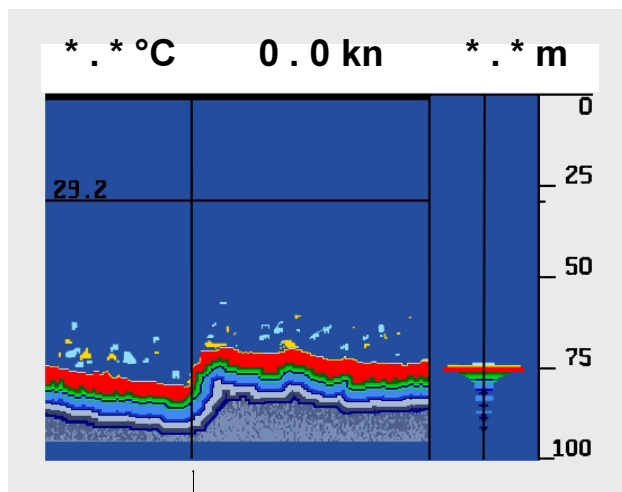


ENT

Use the cursor to highlight 'Turn A-scope ON', and press [ENT] to load the function, or...

A-SCP

... activate the function by pressing the [A-SCP] key



The readout indicates the precise amplitude or strength of each received echo, which often can be used for determining individual species of fish or hardness of the bottom.

Vertical EVENT marker, activated by the [EVENT] key,
- see Appendix A for further details.

ENT

*Open 'Presentation setup' (see display on page 22)
if any changes are required,*

ENT

and confirm entry

+/-

Change range with the + or - key

A-SCP

Turn A-scope OFF again

-can also be turned OFF via the ECHO menu.

 = keys to press

ECHOSOUNDER MENU - Variable range marker

 *Call up the MENU bar*

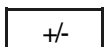


Select 'Turn VRM ON':
 *Use the cursor to highlight 'Turn VRM ON', and press [ENT] to load the function, or...*

 *...activate the function by pressing the [VRM] key*



Move the variable range marker up/down with cursor key

 *Adjust the range by means of the +/- keys*

How to turn variable range marker off again:
 *Call up the MENU bar*



 *Use the cursor to highlight 'Turn VRM OFF', and press [ENT], or...*

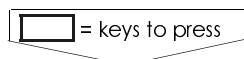
 *...deactivate the function just by pressing the [VRM] key*

Transmitter status window in echo display

The status window shows the selected transmitter frequency, power and pulse length.

50 kHz A HIGH A LONG	- Selected frequency, 50 kHz or 200 kHz. - Transmit power HIGH/LOW - Pulse length SHORT/MEDIUM/LONG
---	---

— A = Automatic mode
 "Nothing" = Manual mode

**ECHOSOUNDER MENU - Presentation setup***Call up the MENU bar**Use the cursor to highlight 'Presentation setup', and press [ENT] to load the display, or...**...press [ENT] from an echo display for direct access to the 'Presentation setup'**Use the cursor to move around in the display and select new values by means of the [-/+] keys.*

Presentation setup:	
Range start: (See Limitation, Appendix A)	000 m
Range:	AUTO
Gain:	15.0dB
Scroll synchroniztion:	TIME
Scroll speed:	MAX
White line:	OFF
Expansion window:	6 m
TVG:	Normal (20 log R)
Water profile:	SALT
Ping to ping filter:	OFF
Signal threshold:	OFF
Colour threshold:	OFF
Depth grid:	OFF
Echosounder frequency:	50kHz

"Echosounder frequency", select 50kHz or 200kHz.
Further details in Appendix A.

Range start can be anywhere from 000 to 999 m.

Range can be set to 100, 150, 200, 250, 300, 400, 500, 750, 1000 units or AUTO for automatic selection of scale to actual depth.

Gain can be set up to 99.9dB.

Scroll synchronization can be set to TIME or DISTANCE.

Scroll speed can be set to LOW, MEDIUM, HIGH, MAX (X2, X4, X8), FREEZE.

Expansion window can be 3, 6, 10, 20, 30, 40, 50 units.

TVG (Time Varying Gain) can be set to Normal or Special.

Water profile can either be SALT or FRESH.

White line, Ping to ping filter, Signal threshold and Depth grid can all be turned OFF or ON.

Colour threshold, set ON to select a color from which you want the below colors not to be shown in the echo display - see scale in echo display.

☞ Refer to Appendix A for further details.

*Confirm entry with [ENT], or exit with [MENU]*

 = keys to press

ECHOSOUNDER MENU - Echosounder setup

MENU

Call up the MENU bar



ENT

Select 'Echosounder setup':

Use the cursor to highlight 'Echosounder setup', and press [ENT] to load the display

Echosounder setup:

Transducer depth below surface:	00.0 m
Keel depth below surface:	00.0 m
Display:	DEPTH BELOW SURFACE
Alarm for fish:	Strength: 30dB OFF
Depth for fish:	min: 0010 m max: 0100 m
Depth alarm maximum:	0100.0 m OFF
Depth alarm minimum:	0010.0 m OFF
Transmitter:	AUTO
Transmit pulse length:	AUTO
Max. depth limit:	AUTO
Demo mode:	OFF

Use the cursor to move around in the display and select new values by means of the [-/+] keys.

Transducer depth and keel depth below surface can be set to max. 99.9 m.

The display can show: DEPTH BELOW SURFACE, DEPTH BELOW TRANSDUCER, DEPTH BELOW KEEL.

Alarm for fish: Set the strength from min.00 (weak echo) to max. 30dB (strong echo), and you can set it ON or OFF.

Depth for fish can be set to min/max 0/9999 units.

Depth alarm can be set to min/max 0/9999 units.

Transmitter can be set LOW, HIGH, AUTO, and OFF to detect noise. 'Transmit pulse length' can be SHORT, MEDIUM, LONG, AUTO.

Max. depth limit: AUTO, 50,75,100,150,200,250,300, 400,500,750,1000 m.

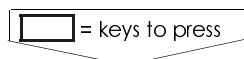
 Refer to Appendix A for further details.

ENT

Confirm entry with [ENT], or...

MENU

... exit with [MENU] without making any changes



SETUP MENU - Speed alarm, units & language



Call up the MENU bar

SETUP			
POS	NAV	ECHO	SETUP
Speed alarm, units & language Interface setup NMEA/alarm Interface setup remote Wind display Display color Master reset			



Use the cursor to highlight 'Speed alarm, units & language', and press [ENT] to call up the display

Setup for speed:

LOG speed sensor: ON
 LOG speed calibration: 019000 PULSES/nm
 Speed alarm maximum: 000.0 kn OFF
 Speed alarm minimum: 000.0 kn OFF

Setup for units:

Depth/altitude in: METRES
 Distance in: NAUTICAL MILES
 Speed in: KNOTS
 Temperature in: DEGREE CELCIUS
 Software version: EQ32 3.05 MKII

WIN change interval: 5 sec. MANUAL
 Display text in: English GB

You can toggle between 'Log speed sensor OFF/ON', where OFF = Speed over ground (from external navigator), and ON = Speed through water.

Refer to readout in Position display.

Calibrate log speed readout by increasing/decreasing the number of PULSES/nm - see also Appendix A.



Use the cursor to go to the function you wish to alter, and then select a new value with the [-/+] key



Confirm entry

The **speed alarm** can be set to max. and/or min. cruising speed thorough water. This may be handy for trawl fishing, entering harbours with speed limits, etc.

How to reset an alarm - the same procedure applies to all activated alarms in the system:

ENT

Reset alarm

Setup for units - The depth/altitude can be set to metres (m), feet (ft) or fathoms (fm).

Distances can be calculated in nautical miles (nm), kilometres (km) or statute miles (mi).

Speed can be shown in knots (kn), kilometres/hour (kh) or miles/hour (mh).

The temperature can be shown in Celcius or Fahrenheit.

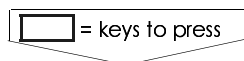
Software version indicates which software version is installed in the unit. In event that a new software version is installed, the unit will need a Master Reset, refer to section 4.3.

WIN change interval can be set to anywhere between 02 to 99 seconds to suit the user's need.

☞ For further details of the WIN function, refer to 'Rotation of WINdows' in section 2.2.

Display text in - as standard the EQ32 MKII is supplied with a national display language + English, but the system is available in a variety of display languages:

English (GB), Danish (DK), Swedish (S), German (D), French (F), Spanish (E), Nederlands (NL), Italian (I), English (US), and Portuguese (P).



SETUP MENU - Display color

(not in monochrome version)



Call up the MENU bar

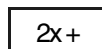


Use the cursor to highlight 'Display color', and press [ENT] to load the display

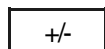
Palette setup :		1
NAME:		
Text:		
Background:		
Cursor:		
Menu text:		
Menu background:		
Menu text highlight:		
Menu highlight:		
Menu frame:		
Menu example:	ECHO	SETUP
Echogram background:		

In this display you can customize the display colors. You can define 9 different display settings of colors for text, background, highlighted menu, etc. **Palette setup 1** is preset to daylight, and no. **2** is preset to nightlight.

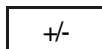
If you wish to make your own special setup in e.g. Palette setup 3, then:



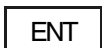
Press [+] twice to select Palette setup 3



Give the setup a name by selecting letters with +/- keys and use cursor to move to next space



Go to, and change color settings



Confirm new setup

3.1 Parts of an echosounder

An echosounder is composed of a display screen, processor, and receiver/transmitter unit which in the case of the EQ32 MKII, are housed in one unit. Connected to this unit by a shielded cable is the transducer which is mounted horizontally on the bottom of the hull or on the transom.

3.1.1 Display screen

The display screen presents in graphic and numerical form the information the processor is receiving and accumulating from the transducer.

3.1.2 Processor

The processor is the "brains" of the echosounder. It is sealed inside the unit which protects it from harm. The processor is composed of highly sophisticated microprocessor, memory and logic circuitry.

3.1.3 Receiver/transmitter

The receiver/transmitter (often called the "transceiver") section of your echosounder takes it's commands from the processor. The processor tells the transceiver to activate the transmitter. The transmitter sends a high voltage transmit "ping" to the transducer mounted on the hull. At that point the transmitter's job is done and the receiver takes over. See Figure 1.

The receiver is also connected to the transducer and amplifies the very small signals received as echoes from fish and the sea floor which arrive at the transducer (see Figure 2). The receiver is designed to reject other signals as much as possible and to provide enough amplification to see even relatively small targets at long ranges.

The amplified receiver signals are then send to the processor to be shown on the display screen.

3.1.4 Transducer

A transducer is a ceramic element in a rugged housing made from reinforced plastic, bronze or stainless steel.

The transducer is attached horizontally to the bottom of the hull. **It is essential that the transducer be mounted properly** (see chapter 5 Installation and service), as echo transmissions are radiated at right angles from the transducer face. Shielded cables connect the transducer with the echosounder.

3.2 How the EQ32 MKII works

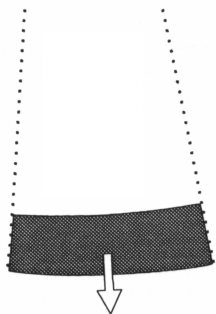


Figure 1 - Transmitted 'ping' from the receiver/transmitter.

When the EQ32 MKII is turned on the processor begins to send electrical pulses to the transducer. The ceramic resonator in the transducer has a special property which enables it to change dimensions slightly when a varying voltage is applied. The voltage is thus converted to mechanical vibrations (sound waves) which are then transmitted down through the water. See Figure 1

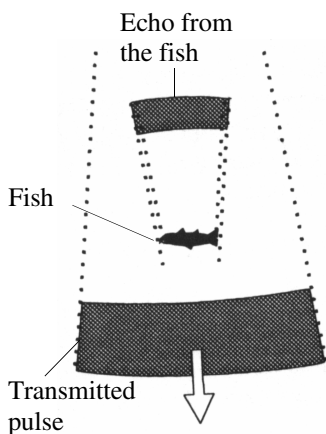


Figure 2 - Echoes returning to the receiver.

The sound waves move through the water until they encounter a change in density, such as a fish or the bottom. This causes the sound waves to "echo" back up through the water. When the reflected sound waves (echoes) hit the transducer the ceramic disk vibrates at the same frequency. This generates a varying voltage between the disk surfaces. This voltage goes back up through the cable to the receiver. The EQ32 MKII processes the signals and presents them on the display screen. See Figure 2

3.2.1. Transducer beamwidth

The transducer mounted to the hull of your vessel serves as both a "speaker" when transmitting, and as a "microphone" when the echo sound is receiving. Similar to the way a flashlight focuses light, most of the sound from your transducer is focused downwards with a smaller amount going out to the sides. The amount of focusing of the sound beam is expressed as a "beamwidth".

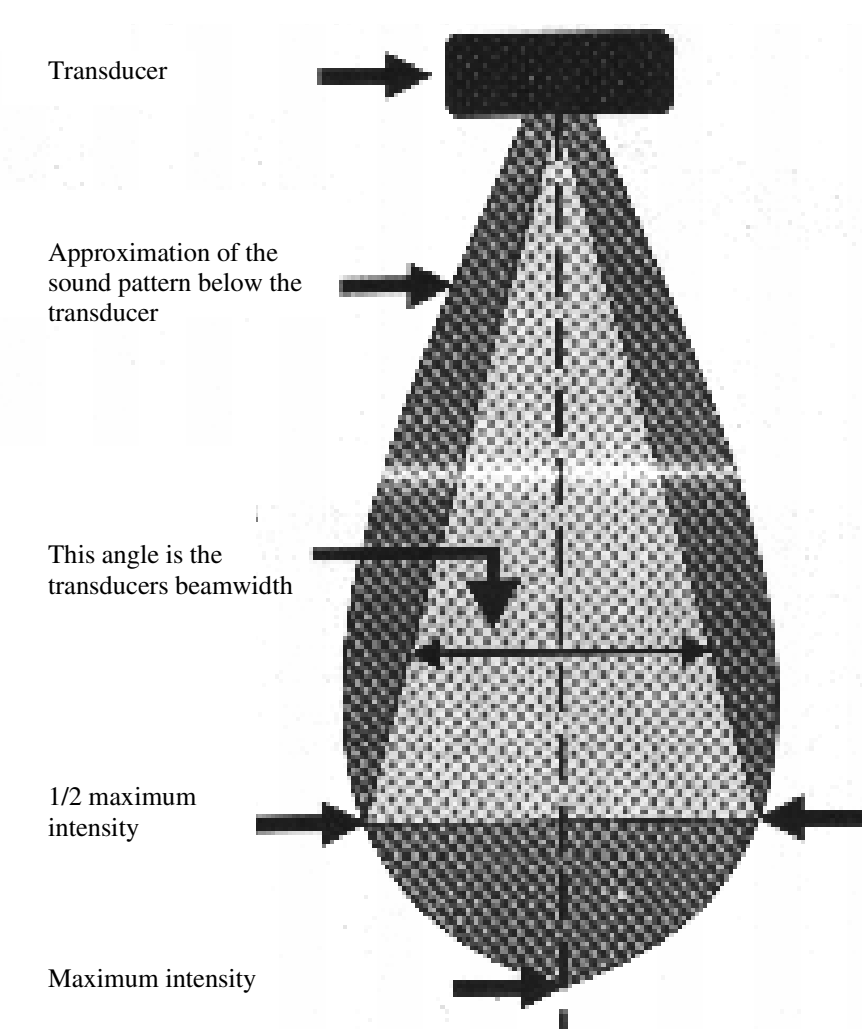


Figure 3 - A representation of a transducer beamwidth.

The center of the sound beam is the most intense, then as you move out towards the sides of the sound beam there is a point where the intensity of the sound is 1/2 what it was in the center. The distance moved is the "beamwidth". See Figure 3

The beamwidth is related to the actual frequency and transducer. The EQ32 MKII 200 kHz will have a 15° beamwidth, and the 50 kHz version will have a 45° beamwidth.

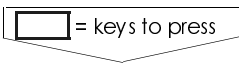
3.2.2 Effects of the vessel's speed

The display of fish on the EQ32 MKII depends directly on the vessel's speed, as well as on the depth of the fish. When the vessel is at rest, the echo traces will appear stretched and flattened. As the vessel's speed becomes greater, the echo traces will become shorter and more arched. The reason for this change in appearance is that as the vessel speed increases fewer number of sound "pings" strike each fish. A low vessel speed will provide the most accurate information of where fish are located.

4.1 Interface settings

SETUP			
POS	NAV	ECHO	SETUP
Speed alarm, units & language Interface setup NMEA/alarm Interface setup remote Wind display Display color Master reset			

The EQ32 MKII has 2 in/out ports, which can be set individually to NMEA 0183, and Dataline (IS11).



= keys to press

4.1.1 Interface setup NMEA/alarm

 *Call up the SETUP MENU*



 *Use the cursor to highlight 'Interface setup NMEA/alarm', and press [ENT] to load the display*

Interface setup NMEA/alarm:			NMEA0183	Use the cursor to move around in the display and select new values by means of the [-/+] keys.
Input (pin 3,4):			NMEA0183	
Position:			GLL ON	
Course:			VTG ON	
Speed:			VTG ON	
Navigation (APB, RMB and XTE):			ON	Interface setup alarm is for external alarm relays.
Water temperature:			MTW OFF	
True wind:			VWT ON	
Relative wind:			MWV ON	
Output pin (1,2):			NMEA0183	Alarm stand-by level can be LOW or HIGH. LOW = 0 volt HIGH = 5 volt
DBK ON	DBS OFF	DBT OFF		
DPT ON	MTW ON	VHW ON		
Interface setup alarm:			ALARM	
Output (pin 5,2):			ALARM ON	
Alarmstand-by level:			LOW	

 = keys to press
NMEA0183 external position, heading and speed input:

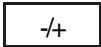
GLL Geographic position, latitude/longitude
 RMA Recommended minimum specific Loran C data
 RMC Recommended minimum specific GPS data
 GGA Global Positioning System fix data
 VTG Course over ground and ground speed

NMEA0183 navigation input:

APB Autopilot sentence "B"
 RMB Recommended minimum navigation information
 XTE Cross-Track-Error, measured

NMEA0183 instrument input:

	IN	OUT
MTW Water temperature	X	X
VHW Water speed heading		X
MWV Wind speed angle	X	
VWT True wind speed and angle	X	
VWR Relative wind speed and angle	X	
DBS Depth below surface		X
DBK Depth below keel		X
DBT Depth below transducer		X
DPT Depth, including offset		X

To change preset interface settings:*Go to the sentences you want to use*

Toggle between ON/OFF

Confirm entry, and confirm warning, or...

exit function without making any changes

 = keys to press

4.1.2 Interface setup remote

 *Call up the SETUP MENU*



 *Use the cursor to highlight 'Interface setup remote', and press [ENT] to load the display*

Interface setup remote:	NMEA0183	
Input (pin 3,4):	NMEA0183	
Position:	GLL OFF	
Course:	VTG OFF	
Speed:	VTG OFF	
Navigation (APB, RMB and XTE):	OFF	
Water temperature:	MTW OFF	
True wind:	VWT OFF	
Relative wind:	MWV OFF	
Output (pin 1,2):	NMEA0183	
DBK ON	DBS OFF	DBT OFF
DPT ON	MTW ON	VHW ON

Use the cursor to move around in the display and select new values by means of the [-/+] keys.

For details on the individual settings, please refer to section 4.1.1.

To change preset input interface settings:

 *Toggle between NMEA0183 and REMOTE:*

- NMEA0183 is compatible with most instruments, including the DE30 Dual Station.
- REMOTE is for the DE30 Dual Station only.

 *Confirm entry, and confirm warning, or...*

 *exit function without making any changes*

 = keys to press

4.2 Wind instrument display

SETUP			
POS	NAV	ECHO	SETUP
Speed alarm, units & language			
Interface setup NMEA/alarm			
Interface setup remote			
Wind display			
Display color			
Master reset			

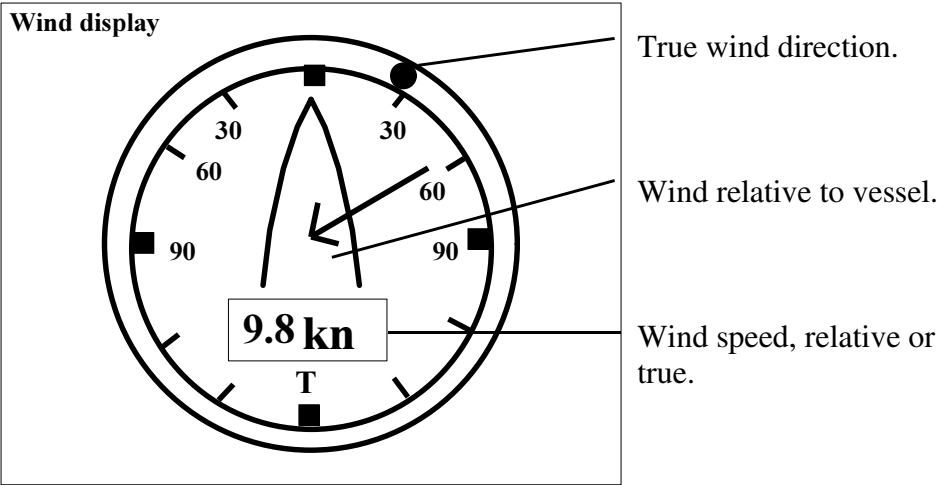
The EQ32 MKII is ready to present wind data from connected instrument.

Wind data

The 'wind instrument' can provide both wind direction and wind speed, and the readings can be shown in relative or true.

 *Call up the SETUP MENU*

  Select 'Wind display':
Use the cursor to highlight 'Wind display', and press [ENT] to load the display



ENT

Call 'Setup for Wind' display

Setup for Wind:

Damping level: LOW

Relative wind scale: NORMAL

Wind angle offset: 000°

Show wind speed as: RELATIVE

Wind speed unit: METERS/SECOND

The damping level can be set to LOW, MEDIUM, or HIGH. The higher level the more steady and slow reacting reading.

The wind-scale can be set to 0-180° (NORMAL), or 0-60° (MAGNIFIED).

The wind angle offset can be from 0 to 360°

The wind speed can be set to TRUE or RELATIVE, and the wind speed unit can be either METERS/SECOND, KNOTS, KILOMETRES/HOUR or MILES/HOUR.

*Go to the function you wish to change*

+/-

Toggle between settings or select new figure

ENT

Confirm entry

 = keys to press

4.3 Master reset

SETUP			
POS	NAV	ECHO	SETUP
	Speed alarm, units & language Interface setup NMEA/alarm Interface setup remote Wind display Display color Master reset		

If the unit is totally locked i.e. no immediate response from the keypad, the unit can be reset by disconnecting the power supply and then starting up again.

If the unit is still 'alive' but has ceased to respond to normal operation, it could become necessary to make a master reset - but first check 'Troubleshooting' in section 6.3.

☞ The master reset will erase all data and settings, and restore the basic settings from the factory.

 *Call up the SETUP MENU*



 **ENT**

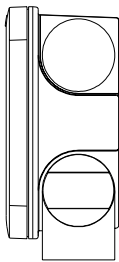
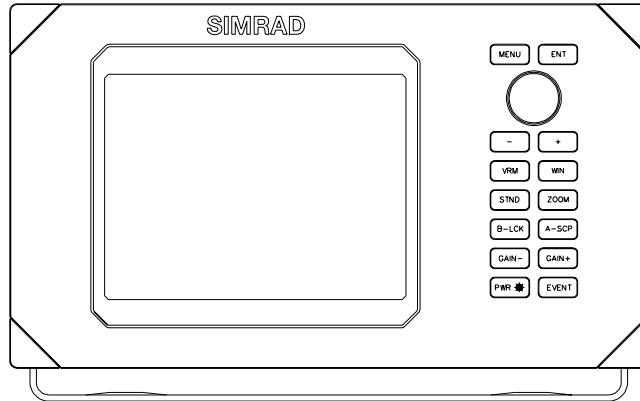
Select 'Master reset' display:
*Use the cursor to highlight 'Master reset',
 and press [ENT] to load the display*

MASTER RESET	
Returns to factory presets.	
RESET: ↑, ↓, ENT	
Exit:	MENU

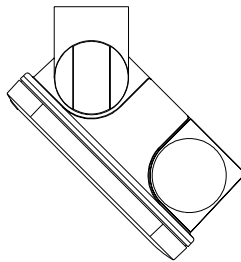
To activate a **master reset**, follow the instructions in the display, or exit the function without making any changes by pressing [MENU].

5.1 Installation of EQ32 MKII

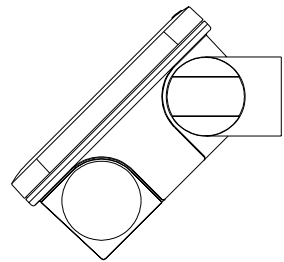
The EQ32 MKII can be flat or bracket mounted - overhead, bulkhead or console.



Console



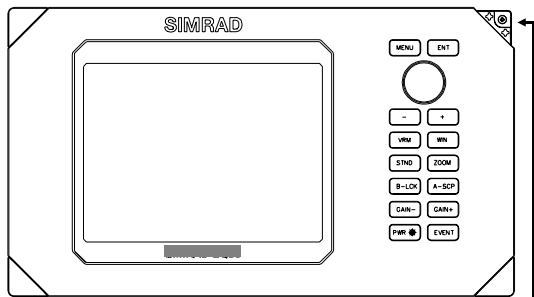
Overhead



Bulkhead



Flat mounted

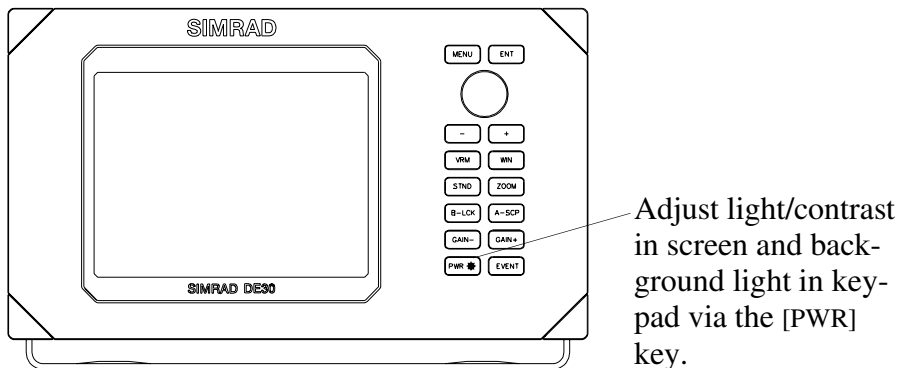


- See template for instructions

- Removable corners, ex.

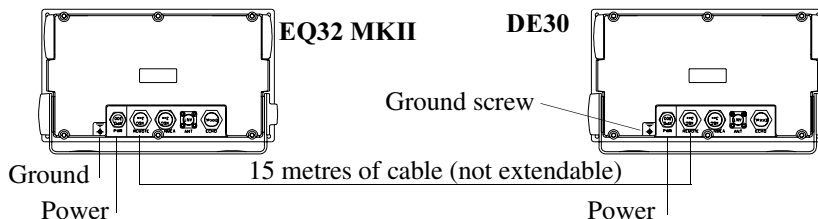
5.2 Installation of Dual Station DE30

The DE30 is a remote control unit for the EQ32 MKII Echosounder. Both units are identical in size and appearance, so the DE30 can also be flat or bracket mounted - overhead, bulkhead or console - as described on the previous page.



A connection cable of 15 meters with two female plugs is supplied with the DE30. Push one of the female plugs into the receptacle marked 'REMOTE' on the back of the EQ32 MKII and the second into the DE30.

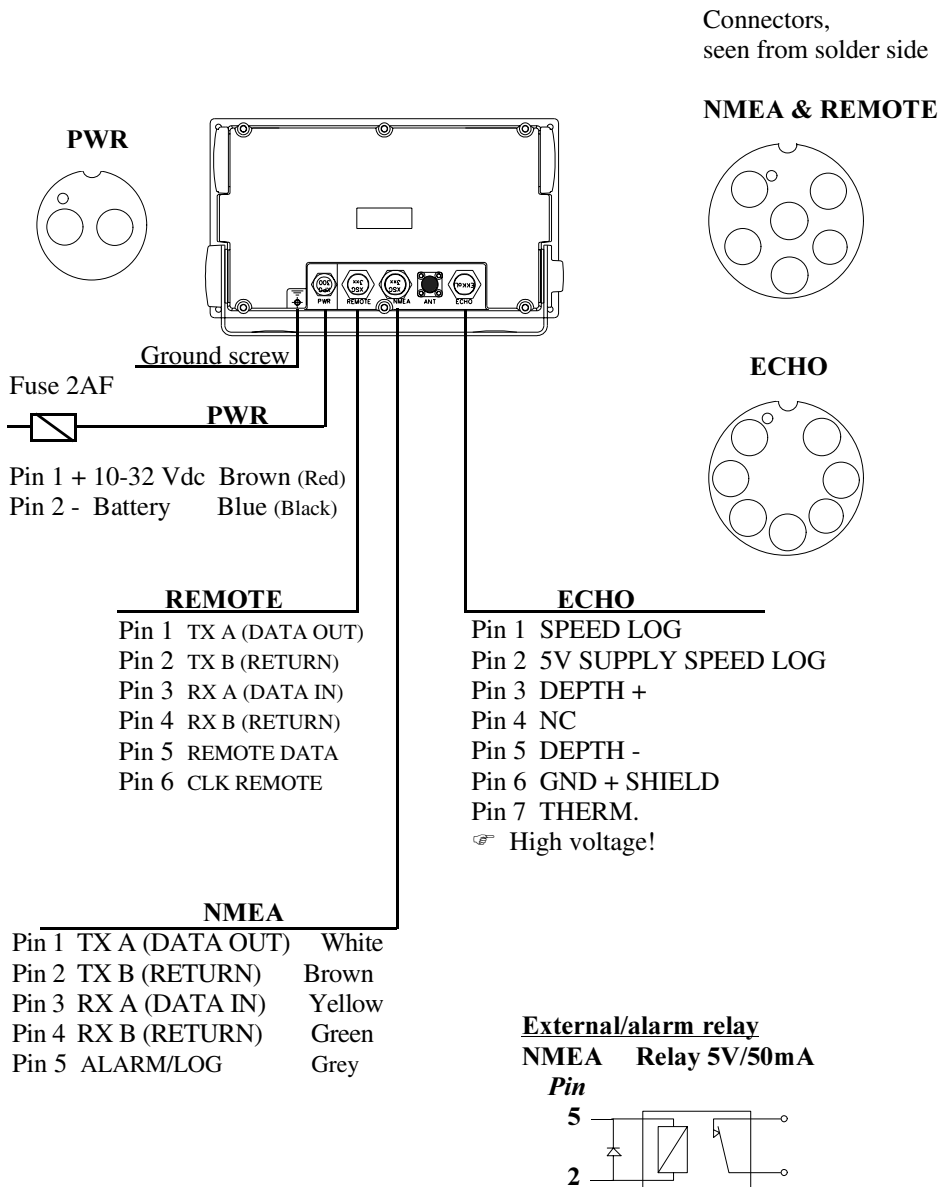
☞ Refer to section 5.3 next page for details on pin numbers.



5.2.1 Operation of DE30

All key commands are relayed to the main unit - EQ32 MKII - and the display picture is instantly transferred back via a high speed link.

5.3 Electrical connections



5.3.1 Optional connections

IS11 (Dataline) Data box

EQ32 MKII NMEA

Data Box

Pin

1	White	TX A (DATA OUT)	+ Radio nav input
2	Brown	TX B (RETURN)	-
3	Yellow	RX A (DATA IN)	WHT NMEA bus to
4	Green	RX B (RETURN)	GRN repeaters

External position, heading and speed

EQ32 MKII NMEA

Pin

3	Yellow	RX A (DATA IN)	NMEA0183
4	Green	RX B (RETURN)	

5.3.2 Power supply connections - The internal voltage regulator will allow the EQ32 MKII to operate normally over the power supply voltage range from 10 to 32 Vdc. Connections between the EQ32 MKII and the external power supply are accomplished by means of the supplied power cable, which is approximately 1.5 meters long.

After connecting the cable to the power source, push the plug as far as it will go into the two pin receptacle marked 'PWR' on the rear of the cabinet and turn the plug's coupling ring clockwise until it clicks into locked position.

5.3.3 Fuse - Warning! Using a fuse which is not specified for your equipment can cause it to blow the instant the EQ32 MKII has been switched on or it will not protect the equipment in the event of trouble.

5.3.4 Transducer connection - A 10 meter cable is supplied for connection between the transducer and the display cabinet - EQ32 MKII. Push the female plug, as far as it goes, into the receptacle marked 'ECHO' on the rear of the cabinet and turn the plug's coupling ring clockwise until it

clicks into locked position. ☞ The EQ32 MKII must be turned off while connecting/disconnecting the transducer cable.

5.3.5 NMEA 0183 interface connections - NMEA 0183 interface connections are made to the receptacle marked 'NMEA' on the rear of the cabinet - turn the plug's coupling ring clockwise until it stops.

☞ The EQ32 MKII must be turned off while connecting/disconnecting the interface cable.

5.4 Basic cable and transducer information

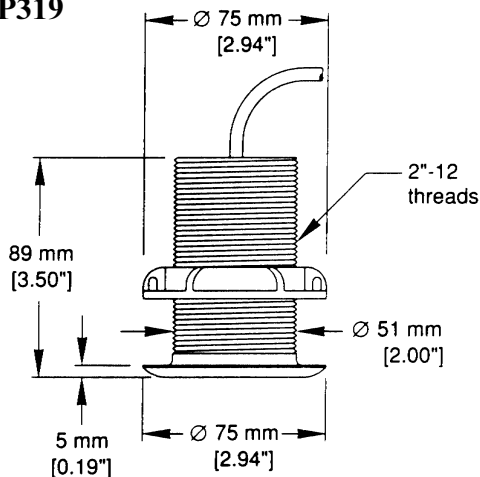
The installation should be carefully planned in advance, keeping in mind the standard cable length of 10 meters (32feet) which is connected to the transducer. In the event where the standard cable is not long enough, up to an additional 10 meters (32 feet) may be connected without affecting the performance of the system. The cable must be of the same type as the standard cable. ☞ The EQ32 MKII must be turned off while connecting/disconnecting the transducer cable.

The use of longer cable runs, while possible, always increases the likelihood of increased interference and decreased performance. Care must be taken when increasing the cable lengths to ensure that proper, adequate and consistent shielding is maintained, that cable of adequate cross section is used, and that all connections are properly made and protected from the effects of the marine environment.

If possible, running the transducer cable through a grounded conduit will greatly decrease the likelihood of interference. Likewise, the EQ32 MKII transducer cable should be run as far as possible from other electrical cabling. If it is absolutely necessary to pass close to other cabling, it is best to keep as much distance as possible, and to make all crossings as close to a right angle as possible.

The EQ32 MKII's transmitter is designed to match the transducers described in section 5.4.1 on next page.

5.4.1 Transducers

P319**Thru-hull mount**

(not for use in wood hulls)

Frequency: 50/200 kHz

Beamwidth: 45°/15°

Cable length: 10m (32')

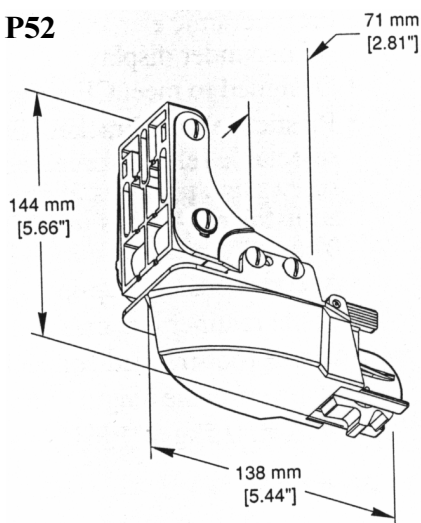
Depth information.

Reference No. 179.0401.002

Housing: Reinforced plastic

Reference No. 179.0401.003

Housing: Bronze

P52**Transom mount**

(for fiberglass, aluminium, wood, or inflatable hulls)

Frequency: 50/200 kHz

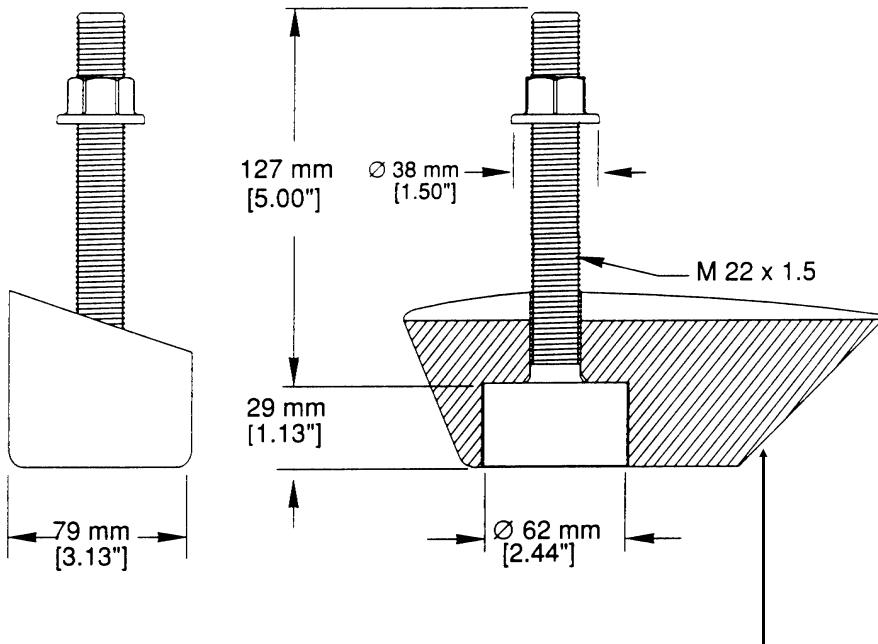
Beamwidth: 45°/15°

Cable length: 10m (32')

Speed, temperature + depth information.

Reference No. 179.0401.001

Housing: chemical resistant, high impact plastic alloy.

B5**Thru-hull stem mount**

Accommodates hull thickness:

Min. no fairing 6mm (1/4")

Max. with fairing 83mm (3 1/4")

Ref. No. 179.0401.011

Optional fairing

Frequency: 50/200 kHz

Beamwidth: 45°/15°

Cable length: 10m (32')

Depth information.

Ref. No. 179.0401.007

Housing: Bronze

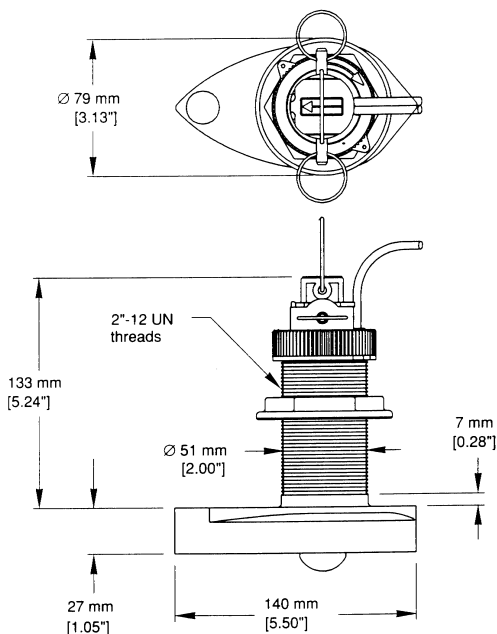
(fiberglass or wood hulls only)

Ref. No. 179.0401.008

Housing: Stainless steel

(compatible with any hull material)

B44V top and side view

**Thru-hull triducer**

Frequency: 50/200 kHz

Beamwidth: 45°/15°

Cable length: 10m (32')

Speed, temperature + depth information.

Ref. No. 179.0401.009

Housing: Bronze

Ref. No. 179.0401.010

Housing: Stainless steel

5.4.2 Determining the position for the transducer

The EQ32 MKII is a sophisticated piece of electronic equipment, but how well it will perform under actual operating conditions will be largely dependent upon the location of the transducer and how it has been installed. Careful consideration, therefore, must be given to selecting the mounting location and on deciding the method of installation that best suits the vessel.

Air bubbles and turbulence caused by the vessel's movement through the water will seriously degrade the transducer's performance. Therefore the transducer should be located well clear of any water intake or discharge line and also clear of any projection along the hull line which might disturb the smooth flow of water.

It is of profound importance for good performance of the EQ32 MKII that the water flowing over the transducer be free of bubbles and aeration. If the transducer face is clean but the performance degrades with increasing vessel speed, then aeration of the water flowing under the transducer may be the cause of the poor performance.

Due to the varying design of ship's hulls and different operating speeds, there can be great variation in the amount of air bubbles which are carried beneath the hull. These bubbles tend to be carried close to the hull as they pass aft. For this reason, it is desirable for the transducer to be mounted on a fairing block which holds the transducer away from the hull and which directs the flow of aerated water around the sides of the transducer rather than over the face of the transducer.

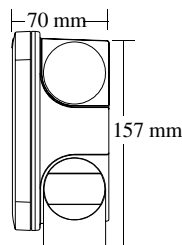
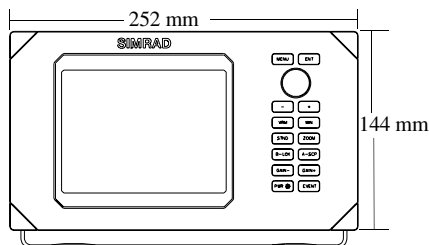
On deep keeled vessels, care must be taken to ensure that the transducer beam will not be blocked by any part of the keel. Although the appropriate mounting location that meets all requirements depends on the type of vessel and its normal operating speeds, a practical choice is usually somewhere between one third and one half of the vessel's water line length from the bow. Levelling blocks may be designed accordingly to meet this requirement.

☞ The more the transducer protrudes from the hull, the better the results will be.

Particularly the lower frequency operation, interference from propeller noise can be a significant problem. This can be seen as an increase in the 'noise' on the echosounder display when the propeller speed is increased. To help reduce this, the transducer's mounting face may be angled slightly forward on the order of 5° for the 50 kHz transducers and 3° for the 200 kHz transducers. The goal is to incline the transducer so that a line of sight along the transducer's radiating surface passes below the propeller.

☞ Keeping the propeller clean and free of any nicks or roughness will assist in minimizing interference from propeller noise due to cavitation.

5.5 Specifications of the EQ32 MKII



General data

Power supply	10-32 V dc
Power drain	10/7 W
Dimensions	144x252x70mm/1.5kg (5.8x10x2.8"/3 Lbs)
Environm.	0°C to +50°C, waterproof
Display, b&w	6-inch, 320x240 pixels STN transfective
- color	5.5-inch, 320x240 pixels TFT, power backlight
Interfacing	2 ports in/out NMEA 0183, dual station, IS11 (Dataline)
Alarm	Output for relay

Echosounder section

Frequency	50 & 200 kHz, user selectable
Output power	Low= approx. 15 w, High= 500 w RMS (4,000 w PP)
Depth range	50kHz: Up to 800m 200kHz: Up to 350m
Beam width	50kHz: 45° 200kHz: 15°
Pulse length	SHORT, MEDIUM, LONG, AUTO
Max ping rate	10 pings per second

Echosounder section (continued)

Alarms	Fish, max/min depth
Zoom mode	Bottom and VRM expansion: 3 to 50 meter, feet or fathoms.
Split screen	Depth and A-scope Depth and bottom expansion Depth and VRM expansion
Event marker	At current ping
Image speed	True distance or time, 3 steps (x2,x4,x8), 1 step/ping and freeze
Fish detection	White line discrimination
Temperature	Transducer or NMEA
Speed (water)	Transducer or NMEA

Options

Triducer (depth, temperature and speed)
NMEA interface cable
DE30 Dual station
Sunhood

6.1 Preventive maintenance

Surface cleaning

To keep the EQ32 MKII cabinet and display screen clean, wipe the surfaces with a clean damp cloth. For heavier cleaning, use a clean, damp cloth which has been dipped in a solution of a mild dish detergent and water. Wring out firmly before wiping the unit.

☞ Do not use cleaning solutions containing spirit or alcohol.

Electrical connections

Periodically check the electrical connections. Make sure that connections are tight and that no cables are frayed or worn.

Transducer

Periodically clean the face of the transducer with a plastic utensil using a scrubbing action.

☞ Do not use a harsh abrasive or a solvent to clean the transducer.

6.2 Repair and service

The EQ32 MKII is sealed and does not contain any user serviceable parts. Opening of this unit will void its warranty. If the EQ32 MKII requires servicing or repair, call your authorized SIMRAD dealer, but first check section '6.3 Troubleshooting procedure'.

Spare parts

Fuses may be bought from a chandlery or a marine supply store. If you require a SIMRAD part, please contact your authorized dealer.

6.3 Troubleshooting procedure

For all fault finding, first check that the supply voltage is between 10 - 32 Vdc.		
Sympton	Check	Remedy
No picture on display screen	Check that the unit is turned on	Press [PWR] key on keypad
	Check fuse in EQ32 MKII power cable. ☞ See warning below.	Replace fuse. Use only type 2 AmpF
Picture appears on the display screen, but image is too dark or too bright		Adjust the image as desired by pressing the [PWR] key, adjust light/contrast, and press the [MENU] key
Echo picture appears normal, but no targets are shown or only random 'noise' is seen	Check that the transducer connector are securely mated with the console	Correctly mate the connector to the console
	Check that the receiver gain is set high enough	Increase the receiver gain. See Chapter 2 - Echosounder menu, Presentation setup section
	Check that the range is correct for the water depth	Adjust the range. See Chapter 2 - Echosounder menu, Presentation setup section
	Check that the Demo mode is not active	Go to 'Echosounder setup' in Echosounder menu and set Demo mode to OFF
No normal picture		Turn unit off and on again.
No response to key operation		Disconnect power and connect again
No normal picture or key operation		Perform master reset, refer to section 4.3
You can not make the system switch between 50 kHz and 200 kHz	Check that the Demo mode is not active	Go to 'Echosounder setup' in Echosounder menu and set Demo mode to OFF

Warning! Do not operate the unit without a fuse. When replacing the fuse, make sure to use the same type of fuse again (2 AmpF), as any other type may cause severe damage to the unit.

Glossary of terms

Alarms - can be set to sound a "beep" if the echosounder detects a target above (shallower than) a minimum alarm depth or below (deeper than) a maximum alarm depth. The EQ32 MKII allows you to set the alarm depths and to enable or disable both the minimum and maximum depth alarms.

A-Scope - a method of displaying the echosounder information.

In A-Scope mode, the echoes are displayed in a "bar-graph" format, with stronger echoes displayed not only in the color representing their target strength, but also in a width representing their target strength.

Color threshold - the color threshold function allows the "weaker" targets and noise which may be shown on the display screen to be eliminated from the display. These targets are usually shown in the weaker target colors such as blues and greens. The Color threshold allows you to choose not to display the blues, or the blues and greens, etc. Doing this will leave only the stronger targets on the display screen.

☞ The monochrome version will have 3 different tones of grey.

Configuration - the configuration functions of the EQ32 MKII allow you to adapt the system more specifically to your needs. You may set Units of measure (feet, fathoms, meters, etc.), Background color, Menu languages, Scroll speed, etc.

Depth Setting the various depth features correctly can have great influence on the performance of the echosounder. In the 'Echosounder setup' display 'Max depth limit' is preset to AUTO, but can be changed to a specific value if the depth is known. This will give a faster ping rate. 'Depth for fish' can be defined to a minimum and maximum depth level if looking for a specific category of fish. See also 'Range' and 'Range start' further on in this appendix.

Echogram background color - is the color shown on the EQ32 MKII in the event no target is present. There are two colors to choose from, white or black, where black is especially useful during nighttime operation when the white background could appear too bright.

Echosounder frequency - 50 kHz or 200 kHz can be selected to suit the task. 200 kHz is for general purpose and offers optimum discrimination and a narrow transmitter beam with a 15° opening. 50 kHz is for searching in a wider area, determining bottom conditions and going the deepest. The transmitter has a wide transmitter beam with a 45° opening.

Event marker - allows the user to set a vertical marker on the screen at the current ping to indicate a school of fish, etc.

Expansion (zoom) - this function allows you to take a closer look at a particular section of the water underneath your boat. You can expand the view near the bottom (Bottom expansion) or near the Variable Range Marker (VRM expansion). The amount of expansion can be adjusted in 'Expansion window', 'Presentation setup'.

Gain - is another way of saying "sensitivity", or possibly "volume". Increasing the gain setting of the EQ32 MKII will allow you to see smaller and deeper targets. If the gain is set too high, however, you will begin to see "noise" and unwanted targets. Generally speaking, you want to set the gain control just below the point that you begin to see speckles of "noise" on the screen.

LOG speed calibration - the unit is preset to receive 19000 pulses per nautical mile from the log transducer (paddle wheel). However the figure might have to be changed to compensate for various transducers and actual waterflow passing the transducer. The correct pulse rate is calculated by:

$$\frac{19000 \times \text{indicated speed (eg. 4kn)}}{\text{actual speed (GPS) (eg. 5kn)}} = 15.200 \text{ pulses/nm}$$

Measurement units - refers to the measurement unit used in the range display. The user may select the displayed units to be one of the following: meters, feet or fathoms.

MENU - the selection of main menus will be shown in the upper part of the screen. The user may move through the menus and make selections by means of the cursor key and the [ENT] key.

NMEA - National Marine Electronics Association. The NMEA is an organization of manufacturers of marine electronics equipment. They have adopted the NMEA 0183 as a standard for communications between various types of marine electronic equipment.

Ping to ping filter - can be set to either on or off. With the filter 'off', then each received echo will be reflected on the screen. Whereas with the filter 'on', the system will compare every two echoes received and only reflect on the screen what is received from both echoes, which will give a more uncluttered and precise recording.

Pulse length - The transmitted pulse length can be set to AUTO, where the optimum setting will be applied according to the water depth. Or it can be set manually, if a specific pulse length is required:

	<u>50kHz</u>	<u>200kHz</u>
SHORT =	less than 5 m deep water	less than 5 m deep water
MEDIUM =	between 5 and 50m deep water	between 5 and 50m deep water
LONG =	more than 50m deep water	more than 50m deep water

☞ A long pulse will reach deeper but give less resolution.

Range - refers to the distance shown from the top to the bottom of the display screen. Selecting **Auto range** will cause the EQ32 MKII to change the basic range setting(s) to keep the displayed bottom in the lower half of the display. For instance, as your boat moves into deeper waters, the EQ32 MKII will automatically switch to a deeper range, always keeping the displayed bottom in the lower half of the display. **Manual range** allows the operator to set the range displayed on the EQ32 MKII.

Range start - allows the user to set the displayed depth range to begin at some point below the surface. For example, a 100 meter displayed range can be "phased" downwards, so that the screen shows a 100 meter section beginning at, say, 200 meters and going to 300 meters depth.

☞ Limitation! With the **White line** feature activated at the same time as the **Range start** happens to be set to a level deeper than the actual water depth, a continuous reset sequence will commence and stay on until the

water depth again exceeds the level entered for the **Range start**.

If you are not about to return to deeper water, we suggest that you disconnect the transducer cable, and thus gain access to adjust the **Range start**, either to zero or to a more appropriate water depth.

Scroll speed - is the rate of movement of the targets on the display screen, moving from right to left. It is adjustable, to allow the user to show a longer "history" on the display screen, if desired.

Scroll synchronization - the screen can be updated on the basis of time or distance (when data from last ping appears on the display).

Signal threshold - can be set to ON to eliminate the appearance of unwanted noise. The threshold level is automatic and the feature should be used with caution, as it may eliminate small fish and small unidentified objects on the screen.

Transducer - the transducer serves as the acoustic "loudspeaker" and "microphone" to send and receive the signals through the water. Transducers are most often made from ceramic elements carefully built into a robust housing. The ceramic elements change shape when a voltage is placed across them (when the EQ32 MKII transmits a signal), and they also generate a voltage when they encounter sound waves (as when the EQ32 MKII is receiving an echo).

TVG Time Varying Gain - is a control that allows the EQ32 MKII to make corrections for most of the losses and absorption that occurs as sound energy passes through sea water. Adjust TVG in 'Presentation setup'. There are two settings to choose from, Normal and Special. The setting 'Normal (20 log R)' is for general fish finding at depths down to 50m (150') and it will also give a uniform bottom echo presentation at shallow, mid and deep water. The setting 'Special (40 log R)' will adjust the TVG to show the same echo strength for a given size fish at varying depths.

White line - is a control which places a white/black line at the displayed sea floor and blanks out 4 pixels just below the line. The purpose of this

is to help the user detect targets, such as fish, which are very close to the sea floor and whose echoes tend to merge with those of the sea floor itself.

VRM - Variable Range Marker. This refers to a horizontal black line shown on the display screen. The user can measure the range to targets shown on the display screen by use of these VRMs. The depth to the VRM can be seen in the left side of the screen.

List of Loran C chains:

Central Pacific	4990	Commando Lion	5970
Gulf of Alaska	7960	North West Pacific	9970
Southeast U.S.	7980	Norwegian Sea	7970
Great Lakes	8970	Mediterranean Sea	7990
Northeast U.S.	9960	Icelandic	9980
Canadian West Coast	5990	Saudi Arabia South	7170
Canadian East Coast	5930	Saudi Arabia North	8990
Labrador Sea	7930	Eastern U.S.S.R.	7950
West Coast U.S.	9940	Western U.S.S.R.	8000
North Pacific	9990		

List of decca chains:

00 S Baltic	0A	24 Skagerak	10B
01 Vestlandet	0E	25 N Persian	5C
02 SW British	1B	26 S Persian	1C
03 North Humber	2A	27 Bombay	7B
04 Holland	2E	28 Calcutta	8B
05 British	3B	29 Bangladesh	6C
06 Lofoten, Norway	3E	30 Hokkaido	9C
07 German	3F	31 Tohoku	6C
08 N Baltic	4B	32 Kyusyu	7C
09 NW Spanish	4C	33 Namaqua	4A
10 Trondelag (N)	4E	34 Cape chain	6A
11 English	5B	35 E Province	8A
12 N Bothnian	5F	36 Dampier	8E
13 S Spanish	6A	37 Port Hedld	4A
14 N Scottish	6C	38 Hokuriku	2C
15 Finland	6E	39 Newfoundld.	2C
16 Danish	7B	40 Cabot strt	6B
17 Irish	7D	41 Nova Scotia	7C
18 Finnmarken	7E	42 Salaya	2F
19 French	8B	43 Kanto	8C
20 S Bothnian	8C	44 SW Africa	9C
21 Hebridean	8E	45 Natal	10C
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Simrad Shipmate AS

Declaration of Conformity

The EMC Directive, Article 10 (1)

Undersigned are herewith declaring, that

Product: SIMRAD EQ32 MKII
Echosounder

is in accordance with the protection requirements in
the EMC Directive 89/336/EØF of May 3rd, 1989

Employed harmonized standards:

EN 60945:1993 / Amd.1:1993

Støvring March 31, 2000

Simrad Shipmate AS
Østre Allé 6
DK-9530 Støvring
Denmark



John Larsen
Executive Vice President

SIMRAD warrants that every product shall be free of defects in material and workmanship as specified below:

CATEGORY “A”: •Autopilots •Radars •Instruments •Navigators •Radiotelephones •Plotters •Gyro compasses •Sonars •Echo sounders •Trawl Instrumentation.

These products are warranted for a period of 24 months on parts and 12 months on labour from date of purchase, except for category B items. Consumable parts such as lamps, fuses, batteries, bearings etc. are not covered by this warranty.

CATEGORY “B”: •Antennas •Transducers •Trawl sensors •Monitors (CRT) •Gyro sensitive elements •Radar magnetrons •Disk drives.

These items are warranted for a period of 12 months on parts and labour from date of purchase.

WARRANTY SERVICE is available through authorised service dealers or national distributors world-wide. Products returned will, at the sole discretion of Simrad, either be repaired or replaced free of charge within normal working hours. Freight charges, insurance, duties or any other costs are the responsibility of the customer.

Maximum liability shall not, in any case, exceed the contract price of the products claimed to be defective.

ON BOARD SERVICE can be arranged by authorised local service dealers or national distributors upon request. Labour costs for the repair/replacement of the defective modules/parts will be free of charge provided a valid warranty is confirmed. Overtime, travel, lodging, per diem, insurance, duties or any other costs are the responsibility of the customer. Additional expenses connected with replacement of transducers such as dry docking, diving and precautionary measures are not covered by this warranty.

VALIDITY: This warranty is effective only when warranty certificate or proof of purchase and equipment serial number is presented. Furthermore, the installation and operation has to be carried out in accordance with the product manual. Warranty liability does not apply to any equipment which has become inoperative due to misuse, accident, neglect, sea water damage or unauthorised repair. Simrad will not be liable for any loss, incidental or consequential damages whether based upon warranty, contract or negligence, or arising in connection with the sale, installation, use or repair of the product. Consequential damages include, but are not limited to, any loss of profit, property damage or personal injury.

The terms of warranty as described does not affect your statutory rights.

WARRANTY CARD
TO BE RETAINED BY THE OWNER

Simrad Shipmate AS
Østre Allé 6
DK-9530 Støvring
Denmark



OWNER

VESSEL

ADDRESS

HOME PORT

EQUIPMENT

TYPE

SERIAL NO.

DATE OF PURCHASE

DATE OF INSTALLATION

YES: NO:
INSTRUCTION FOR USE GIVEN

AUTHORIZED INSTALLER/DEALER STAMP

SIMRAD warrants that every product shall be free of defects in material and workmanship as specified overleaf:

tear out

WARRANTY CARD

To be mailed to the NATIONAL DISTRIBUTOR (see overleaf)
together with the installation report *WITHIN 14 DAYS*
from the date of installation.

Simrad Shipmate AS
Østre Allé 6
DK-9530 Støvring
Denmark



OWNER

ADDRESS

EQUIPMENT

VESSEL

HOME PORT

TYPE

SERIAL NO.

DATE OF PURCHASE

DATE OF INSTALLATION

(CUSTOMER'S SIGNATURE)

(DEALER'S SIGNATURE)

STAMP
HERE

NATIONAL SIMRAD DISTRIBUTOR:
